

## COUNTRY ANALYSIS BRIEFS

# Bolivia

Last Updated: October 2005

### Background

***With one of the largest natural gas reserves in South America, Bolivia has the potential to become a natural gas hub in the Southern Cone.***

Bolivia is one of the poorest countries in South America, with its 2004 per-capita gross domestic product of \$2,600 being the lowest in the region and one of the lowest in the Western Hemisphere. Following sub-par economic growth from 1999 to 2002, Bolivia's economy has preformed better in recent years, posting real GDP growth of 2.4 percent in 2003 and 3.7 percent in 2004. Global Insight forecasts that Bolivia's economy will grow by 3.0 percent in 2005 and 3.3 percent in 2006. The country's most important exports include natural gas, minerals, and agricultural products.



Bolivia has the second-largest proven natural gas reserves in South America, behind Venezuela. The country could use these resources to stimulate the economy and promote greater prosperity. However, issues surrounding the development of its natural gas resources have caused increasing social tension in Bolivia, leading to nationwide demonstrations and the resignation of two presidents in as many years. Interim President Eduardo Rodriguez has scheduled new presidential elections for December 2005.

### Oil

***Bolivia meets most of its oil demand through domestic production.***

According to *Oil and Gas Journal (OGJ)*, Bolivia had proven crude oil reserves of 440 million barrels in 2005. Bolivia's Yacimientos Petroliferos Fiscales Bolivianos (YPFB) gives a slightly higher figure of 465 million barrels for proven oil reserves in 2005. Greater exploration activity and investment by oil companies in Bolivia have rapidly increased the country's proven oil reserves; according to YFPB, Bolivia only had 116 million barrels of proven oil reserves in 1997. The Tarija department, located in southwestern Bolivia, contains over 80 percent of the country's total reserves.

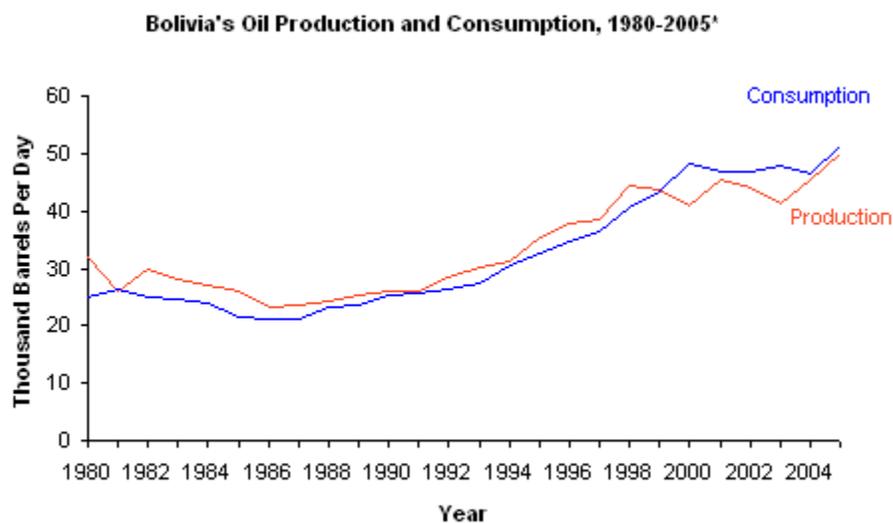
### Sector Organization

Bolivia privatized its oil sector in the mid-1990s. Formally state-owned oil company YFPB divested most of its assets, though the company retained responsibility for negotiating and

monitoring contracts with foreign oil companies. Principle regulatory authority over the oil sector belongs to the Hydrocarbons Superintendent, which also regulates the natural gas sector. Transredes, majority-owned by Royal Dutch Shell and Prisma Energy, operates the oil pipeline network.

Foreign companies hold sway over the bulk of Bolivia's oil sector. Brazilian state-owned oil company Petrobras holds 41 percent of the country's proven oil reserves. The second-largest oil company in Bolivia is Repsol-YPF, which holds 35 percent of the country's proven oil reserves. Other foreign operators include Total, BG, and Pluspetrol. The two former upstream units of YPFB, Chaco and Andina (owned by Repsol-YPF), control 10 percent of proven reserves.

Bolivia passed a new hydrocarbons law in 2005, bringing into question the future of oil exploration in the country (see the discussion [here](#)). While the law has the greatest impact upon the natural gas sector, there will likely be effects upon the oil sector as well. In particular, higher tax rates on oil production could deter future investment.



### Exploration and Production

According to YPFB, Bolivia produced 50,040 barrels per day (bbl/d) of oil (including crude oil, condensates, and natural gas liquids) during the first half of 2005. This represented a 9 percent increase over the same period in 2004. Petrobras is the largest producer in the country, followed by Repsol-YPF; YPFB reported that the companies produced 21,500 bbl/d and 18,470 bbl/d, respectively, during the first half of 2005. Bolivia consumed an average of 51,240 bbl/d of oil in 2005, making it largely self-sufficient in oil.

### Pipelines

Transredes operates Bolivia's domestic oil transportation network. The 430-mile Northern System transports crude oil and condensates from Carrasco to the cities of Santa Cruz and Cochabamba. The 610-mile Southern System connects Yacuiba to Santa Cruz, carrying crude oil and liquefied petroleum gas (LPG). The 310-mile Central System links Santa Cruz with Cochabamba.

#### International Pipelines

Transredes operates a small, 18,000-bbl/d crude oil pipeline between Cochabamba and Arica, Chile. The pipeline operates only occasionally.

### Downstream

According to *OGJ*, Bolivia had 47,250 bbl/d of crude oil refining capacity in 2005. The country has two refineries, both operated by Petrobras. These refineries entirely meet the country's demand for gasoline and jet fuel. However, the country still must import some petroleum products, especially diesel, due to a lack of suitable domestic refining capacity.

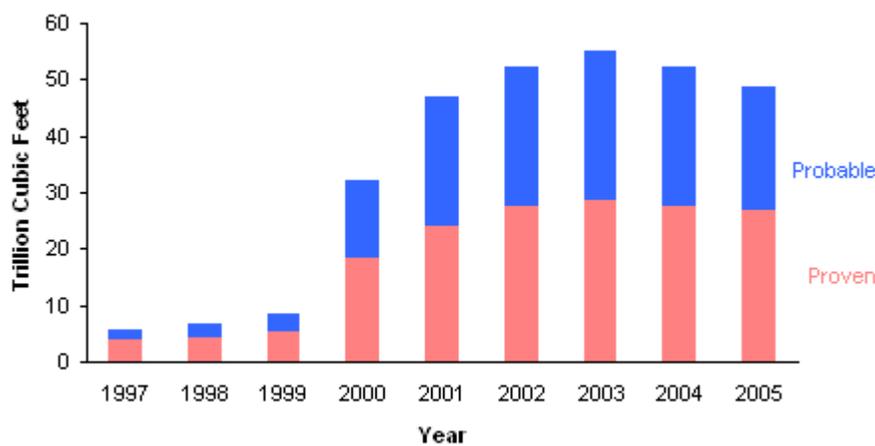
## Natural Gas

**Bolivia has the second-largest natural gas reserves in South America, after Venezuela .**

According to *Oil and Gas Journal (OGJ)*, Bolivia had proven natural gas reserves of 24.0 trillion cubic feet (Tcf) in 2005. Bolivia's Yacimientos Petroliferos Fiscales Bolivianos (YPFB) gives a slightly higher figure for 2005 proven natural gas reserves of 26.7 Tcf. Tarija department contains over 85 percent of the country's total reserves, followed by Santa Cruz department (10.6 percent) and Cochabamba department (2.5 percent).

In the mid-1990s, Bolivia privatized its natural gas sector, leading to an influx in foreign investment. The resulting increase in exploration has led to a 600 percent increase in proven natural gas reserves since 1997. There have been several important discoveries in recent years, many containing reserves (proven, probable, and possible) in excess of 10 Tcf. The most important of these finds include Margarita (13.4 Tcf), Ipati (12.0 Tcf), San Alberto (11.8 Tcf), and Sabalo (10.8 Tcf). However, since 2003, probable and proven reserves have declined slightly.

**Bolivia's Natural Gas Reserves, 1997-2005**



Source: YFPB

### Sector Organization

Foreign companies dominate the natural gas sector in Bolivia. Based on the quantity of reserves held, the largest company is Repsol-YPF. The company holds a large amount of these reserves through its subsidiary, Andina, a company that the government plans to re-nationalize per the [2004 referendum](#). Brazilian state-owned oil and gas company Petrobras ranks as the largest natural gas producer in the country.

The development of Bolivia's natural gas reserves has been a divisive question in the country. Two issues lie at the heart of the controversy. First, there are questions surrounding proposed export paths for liquefied natural gas (LNG), since Bolivia is landlocked. In 2001, Repsol-YPF led a consortium to develop the Pacific LNG project, which would include a natural gas pipeline connecting an LNG export terminal at a port in Chile. The plan presented political problems due to a land dispute between Bolivia and Chile dating to a war the two countries fought in the 19<sup>th</sup> century. In 2003, the Bolivian government decided to move forward with the Pacific LNG project, sparking a wave of protests throughout the country and leading to the resignation of President Sanchez. The Bolivian government has since endorsed a plan to export LNG via a terminal in Peru, but international investors have balked at the idea, due to its higher cost compared to the Chilean plan. Further delays could scuttle the LNG plan completely, since the project would depend upon securing access to an LNG regasification terminal in Mexico or the United States: due to delays in potential LNG exports from Bolivia, such planned and existing terminals have begun to sign long-term supply agreements with other LNG suppliers.

Second, many groups in Bolivia have called for the re-nationalization of Bolivia's natural gas resources. In 2004, Bolivia overwhelmingly approved a referendum that called for the re-nationalization of the formerly state-owned Andina and Chaco oil and natural gas operators. The referendum also called for a sizable increase in taxes on foreign hydrocarbon producers. Additional protests in 2005 forced the resignation of President Mesa, after he opposed implementing the referendum. Following this unrest, foreign investment in Bolivia's natural gas

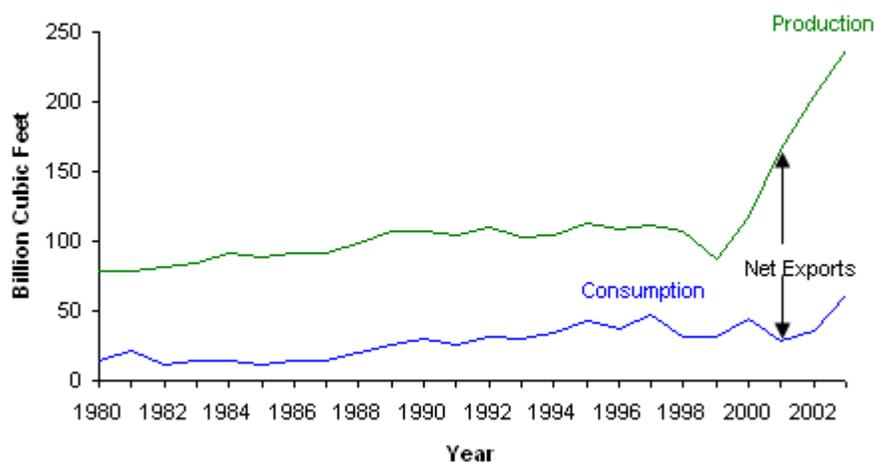
sector plummeted. The country's Chamber of Hydrocarbons, a trade group, reported that investment during the first half of 2005 fell by 80 percent compared to the same period in 2004.

In May 2005, Bolivia's Congress approved a new Hydrocarbons Law that codified the results of the 2004 referendum. The law levies an additional 32 percent tax on oil and gas production at the wellhead, on top of the existing 18 percent royalty. The law calls for the compulsory conversion of existing contracts to the terms of the new law, a provision that international companies have protested and threatened to appeal before international arbitration panels. The new Hydrocarbons Law likely will not affect current natural gas production, but could have serious repercussions on the future expansion of the sector.

### Exploration and Production

During the first half of 2005, YFPB reported that Bolivia produced 1.4 billion cubic feet per day (Bcf/d) of natural gas. More than 70 percent of the country's production occurs in the Tarija department. The largest natural gas producer in Bolivia is Petrobras, which produced 729.0 Mmcf/d of natural gas during the first six months of 2005. Petrobras receives 95 percent of its production from two natural gas fields, San Alberto and Sabalo, which represent about one-half of Bolivia's total production. The second largest producer is Repsol-YPF, which produced 378.1 Mmcf/d during that period. Bolivia had domestic natural gas consumption of 168.2 million cubic feet per day (Mmcf/d) in 2003, a 71 percent increase from 2002, leaving a large surplus available for export.

**Bolivia's Natural Gas Production and Consumption, 1980-2003**

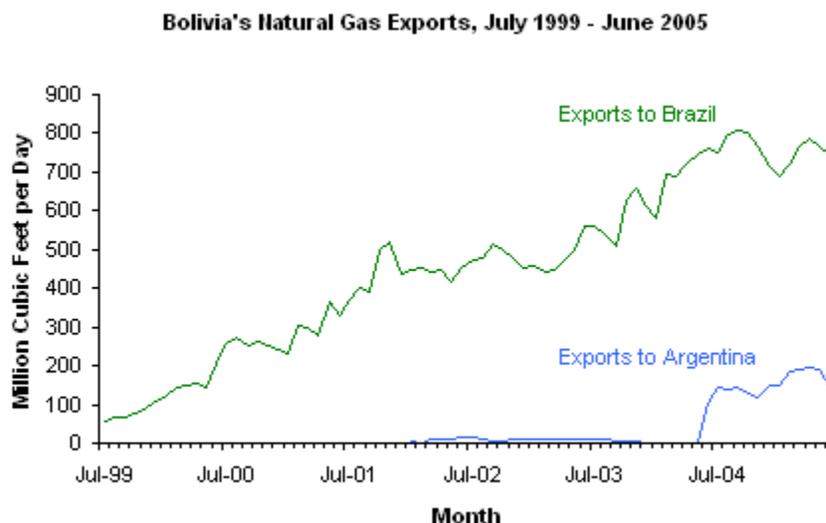


Source: EIA

### Exports

Bolivia currently exports natural gas to [Brazil](#) and [Argentina](#). In 1999, Bolivia began exporting to Brazil under a 20-year, take-or-pay contract. The nature of the contract has caused tension between the two countries in the past. Due to economic conditions and delays in the construction of gas-fired power plants, Brazil has not taken delivery of all of the contracted volume of 1.0 Bcf/d, though it still must pay for the entire amount. Current volumes are around 850 Mmcf/d. However, Brazil has projected that its natural gas demand will increase in the near future, and has talked with Bolivia about doubling the amount of natural gas it purchases from the country.

Bolivia began natural gas exports to Argentina in 1972. While significant exports stopped in 1999, the country resumed exporting sizable amounts of natural gas to Argentina in 2004 in an attempt to help alleviate the Argentine energy crisis. The current contract between the two countries calls for Bolivia to export up to 230 Mmcf/d of natural gas to Argentina, but the countries have discussed increasing this volume in the future through the construction of an additional pipeline.



Source: Ministry of Hydrocarbons; YFPB

#### *Liquefied Natural Gas (LNG)*

As mentioned above, the Pacific LNG consortium planned the construction of an LNG export terminal in [Chile](#), fed by natural gas from Bolivia. However, the July 2004 referendum called for any LNG export plan to utilize a terminal in [Peru](#), effectively killing the Pacific LNG project. No foreign investors have come forward with a concrete plan to pursue the Peruvian export option. For its part, the Bolivian government has stated that it will emphasize piped gas exports, unless a new LNG plan materializes.

#### **Pipelines**

##### *Domestic System*

Transredes operates Bolivia's domestic natural gas transport network. The 790-mile northern section of the system connects the cities of La Paz, Oruro, Cochabamba, and Santa Cruz with natural gas fields in the Chapare region. The 1,100-mile southern section of the system connects the cities of Sucre, Potosi, and Tarija with the natural gas resources of the Gan Chaco region; the southern system also connects domestic natural gas resources with export pipeline to Brazil and Argentina.

##### *International Connections*

The Gasbol pipeline facilitates Bolivia's natural gas exports to Brazil. The 2,000-mile Gasbol connects Santa Cruz, Bolivia to Porto Alegre, Brazil, via Sao Paulo. The system has a maximum capacity of 1 Bcf/d. Gasbol also has a 170-mile, 100-Mmcf/d extension that connects to a gas-fired power plant in Cuibana, Brazil.

Bolivia exports natural gas to Argentina via the 340-mile, 230-Mmcf/d Yabog pipeline. In August 2005, the two countries agreed to extend the existing supply contract through 2007. There is also talk between the two countries over expanding Bolivian gas exports to Argentina. Such an expansion would require the construction of an additional pipeline, since the Yabog system is at capacity. To that end, the two have proposed the construction of the \$1 billion Northeastern Pipeline, which would have a maximum capacity of 700 Mmcf/d.

#### **Electricity**

***Bolivia generates the majority of its electric power from natural gas-fired plants.***

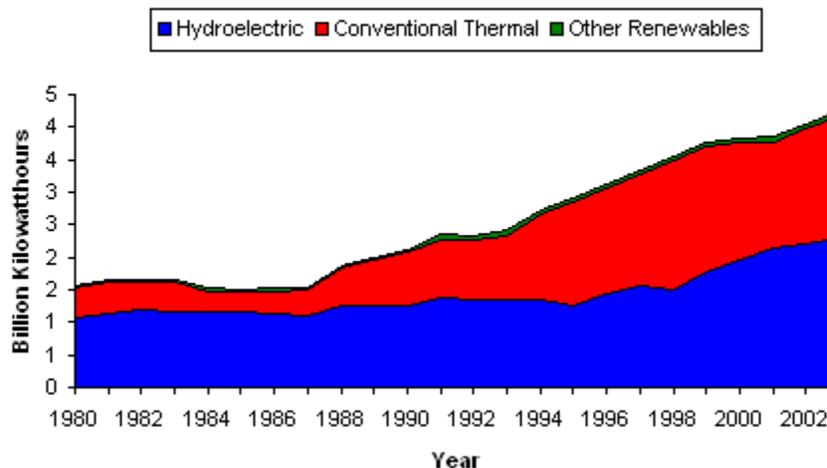
According to Bolivia's Superintendent of Electricity (SE), the country had 1.4 gigawatts of installed electricity generating capacity in 2004. Of that total, 67 percent is conventional thermal, with the remainder consisting of hydroelectricity. Bolivia generated 3.9 billion kilowatt-hours (Bkwh) and consumed 3.8 Bkwh of electric power in 2004. This does not include electricity generated in rural areas from biomass facilities, which are unorganized, decentralized, and difficult to quantify.

##### **Sector Organization**

In 1994, Bolivia privatized the state-owned electricity system, unbundling generation, transmission, and distribution activities. The law forbids any single company from operating in more than one of these principle activities. The government also established the SE as the

principle regulator of the sector. The country has two principle electricity systems: the Sistema Interconectado Nacional (SIN) and the Aislado. The SIN connects major population centers and represents 83 percent of installed capacity. The Aislado system consists of numerous autoproducers and independent power plants in rural or isolated areas not served by the SIN.

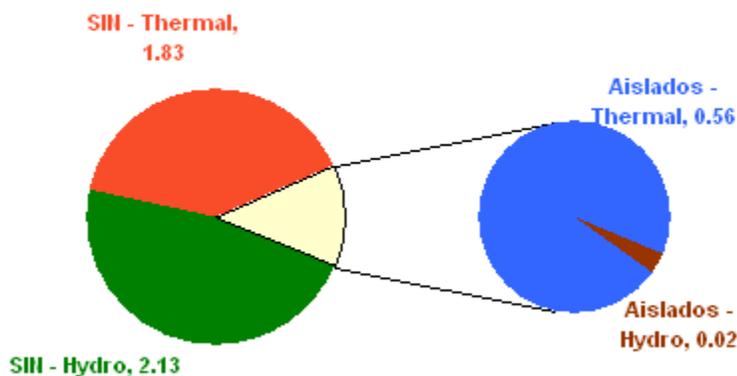
**Bolivia's Net Electricity Generation, by Source, 1980-2003**



Source: EIA

There were eight generation companies serving the SIN in 2004. Of these, the largest is the Compañía Boliviana de Energía Eléctrica (COBEE), a subsidiary of U.S.-based Globeleq. COBEE serves the region surrounding La Paz, the capital. Other important generating companies include Empresa Eléctrica Guarachi (EGSA) and Empresa Eléctrica Corani (CORANI, majority-owned by Duke Energy). These three companies controlled 69 percent of the total gross electricity generation in Bolivia in 2004. In the distribution sector, there are six companies active, the largest being Electropaz, majority-owned by Spain's Iberdrola. Other large distribution companies include Empresa de Luz y Fuerza Eléctrica Cochabamba (ELFEC), a subsidiary of PPL Global, and Cooperativa Rural de Electrificación (CRE). Combined, Electropaz, ELFEC, and CRE held 86 percent of the power distribution market in 2004.

**Bolivia's Gross Electricity Generation, by System and Source, 2004 (billion kilowatthours)**



Source: Superintendent of Electricity

Transportadora de Electricidad (TDE), owned by Spain's Red Eléctrica de España, operates the national medium- and high-tension electricity transmission network underlying the SIN. The grid extends over 1,200 miles and covers the central and southern parts of the country. The

population in the northern and western parts of the country remains largely unconnected to the national grid, either served by the Aislado system or having no access to electricity at all.

### Hydroelectricity

Unlike most South American countries, Bolivia is not heavily dependent upon hydropower for its electricity supply. SE reported in 2004 that Bolivia had 460 megawatts (MW) of installed hydroelectric capacity spread amongst 21 facilities throughout the country. CORANI operates the largest facility, the 93-MW Saint Isabel plant.

### Conventional Thermal

Bolivia had 920 MW of installed conventional thermal generating capacity in 2004, according to SE. All of this capacity primarily burns natural gas, though a few plants also use diesel as a backup fuel. EGSA operates the 290-MW GUARACACHI facility, the largest in the country. Other important facilities include the 130-MW Carrasco, operated by Empresa Electrica Valle Hermoso (EVH) and the 120-MW Bulo Bulu, operated by Compania Electrica Central Bulo Bulu (CECBB).

## Profile

### Country Overview

<b>Head of Government</b>	President Eduardo Rodriguez (since June 2005)
<b>Location</b>	Central South America, southwest of Brazil
<b>Independence</b>	6 August 1825 (from Spain)
<b>Population (2005E)</b>	8,857,870
<b>Languages</b>	Spanish (official), Quechua (official), Aymara (official)
<b>Religion</b>	Roman Catholic 95%, Protestant (Evangelical Methodist) 5%
<b>Ethnic Group(s)</b>	Quechua 30%, mestizo (mixed white and Amerindian ancestry) 30%, Aymara 25%, white 15%

### Economic Overview

<b>Currency/Exchange Rate (October 6, 2005)</b>	1 boliviano = \$0.12
<b>Inflation Rate (2004E, 2005E, 2006F)</b>	4.4%, 5.4%, 4.4%
<b>Gross Domestic Product (GDP, 2004E, 2005E, 2006F)</b>	\$8.8 billion, \$9.0 billion, \$9.6 billion
<b>Real GDP Growth Rate (2004E, 2005E, 2006F)</b>	3.6%, 3.0%, 3.3%
<b>Unemployment Rate (2003E)</b>	9.2%
<b>External Debt (2004E)</b>	\$5.4 billion
<b>Exports (2004E)</b>	\$2.2 billion
<b>Exports - Commodities</b>	natural gas, soybeans and soy products, crude petroleum, zinc ore, tin
<b>Exports - Partners (2004E)</b>	Brazil 33.9%, US 12.7%, Colombia 11.8%, Venezuela 11.6%, Peru 5.1%, Japan 4.2%
<b>Imports (2004E)</b>	\$1.8 billion
<b>Imports - Commodities</b>	petroleum products, plastics, paper, aircraft and aircraft parts, prepared foods, automobiles, insecticides, soybeans
<b>Imports - Partners (2004E)</b>	Brazil 25.3%, Argentina 17%, US 13.1%, Chile 9.2%, Peru 7.2%
<b>Current Account Balance (2004E)</b>	\$285 million

### Energy Overview

<b>Minister of Hydrocarbons</b>	Jaime Eduardo Dun Castellanos
<b>Proven Oil Reserves (January 1, 2005E)</b>	0.4 billion barrels
<b>Oil Production (2005E)</b>	35.5 thousand barrels per day, of which 66% was crude oil.
<b>Oil Consumption (2005E)</b>	51.2 thousand barrels per day

<b>Proven Natural Gas Reserves (January 1, 2005E)</b>	24 trillion cubic feet
<b>Natural Gas Production (2003E)</b>	0.2 trillion cubic feet
<b>Natural Gas Consumption (2003E)</b>	61.4 billion cubic feet
<b>Recoverable Coal Reserves (2003E)</b>	1.1 million short tons
<b>Coal Production (2003E)</b>	None
<b>Coal Consumption (2003E)</b>	None
<b>Electricity Installed Capacity (2003E)</b>	1.3 gigawatts
<b>Electricity Production (2003E)</b>	4.3 billion kilowatt hours
<b>Electricity Consumption (2003E)</b>	4 billion kilowatt hours
<b>Total Energy Consumption (2003E)</b>	0.2 quadrillion Btus*, of which Oil (53%), Natural Gas (33%), Hydroelectricity (13%), Other Renewables (1%), Coal (0%), Nuclear (0%)
<b>Total Per Capita Energy Consumption (2003E)</b>	21.3 million Btus
<b>Energy Intensity (2003E)</b>	8,720.8 Btu per \$2000-PPP**

## Environmental Overview

<b>Energy-Related Carbon Dioxide Emissions (2003E)</b>	10.8 million metric tons, of which Oil (65%), Natural Gas (35%), Coal (0%)
<b>Per-Capita, Energy-Related Carbon Dioxide Emissions (2003E)</b>	1.2 metric tons
<b>Carbon Dioxide Intensity (2003E)</b>	0.5 Metric tons per thousand \$2000-PPP**
<b>Environmental Issues</b>	the clearing of land for agricultural purposes and the international demand for tropical timber are contributing to deforestation; soil erosion from overgrazing and poor cultivation methods (including slash-and-burn agriculture); desertification; loss of biodiversity; industrial pollution of water supplies used for drinking and irrigation
<b>Major Environmental Agreements</b>	party to: Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Tropical Timber 94, Wetlands signed, but not ratified: Environmental Modification, Marine Life Conservation, Ozone Layer Protection

## Oil and Gas Industry

<b>Organization</b>	Fully privatized, foreign companies control most production and reserves.
<b>Major Oil/Gas Ports</b>	None (landlocked)
<b>Foreign Company Involvement</b>	BG, BHP, BP, Orca Petroleum, Perez Companc, Petrobras, Pluspetrol, Repsol-YPF, Royal Dutch Shell, Total.
<b>Major Oil Fields (production, bbl/d)</b>	Sabalo (13,100), San Alberto (7,400), Margarita (3,600)
<b>Major Natural Gas Fields (production, Mmcf/d)</b>	Sabalo (385.5), San Alberto (304.6), Vuelta Grande (85.7)
<b>Major Pipelines (capacity)</b>	Gasbol (1.0 Bcf/d), Yabog (230 Mmcf/d)
<b>Major Refineries (capacity, bbl/d)</b>	Cochabamba (27,250), Santa Cruz de la Sierra (20,000)

\* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.

\*\*GDP figures from OECD estimates based on purchasing power parity (PPP) exchange rates.

## Links

### EIA Links

[EIA - Country Information on Bolivia](#)

### U.S. Government

[U.S. State Department Background Notes on Bolivia](#)

[U.S. State Department Consular Information Sheet on Bolivia](#)

[CIA World Factbook on Bolivia](#)

[U.S. Embassy in Bolivia](#)

### Foreign Government Agencies

[Superintendency for Electricity](#)

[Ministry of Hydrocarbons](#)

[Superintendency for Hydrocarbons](#)

[Comité Nacional de Despacho de Carga](#)

### Oil and Natural Gas

[Transportadora Brasileira Gasoducto Bolivia-Brasil SA \(TBG\)](#)

[Gasorient Boliviano Ltda](#)

[Gasocidente do Mato Grosso Ltda. \(Gasmat\)](#)

### Electricity

[Transredes](#)

[Empresa de Luz y Fuerza Eléctrica Cochabamba \(Elfec\)](#)

[Empresa Eléctrica Corani](#)

[Hidroeléctrica Boliviano](#)

[NRG Energy](#)

[Transportadora de Electricidad](#)

## Sources

Associated Press

BBC News

Bolivia 's Superintendency for Electricity

Bolivia 's Superintendency for Hydrocarbons

Central Bank of Bolivia

CIA World Factbook

Comite Nacional de Despacho de Carga

Dow Jones

Global Insight

The Economist

Economist Intelligence Unit ViewsWire

Financial Times

International Monetary Fund

New York Times

OLADE

Oil Daily

Petroleum Economist

Transportadora Brasileira Gasoducto Bolivia-Brasil

U.S. Energy Information Administration

Wall Street Journal

Washington Post

World Markets Online.

## Contact Info

Charles Esser

(202)586-9502

[lowell.feld@eia.doe.gov](mailto:lowell.feld@eia.doe.gov)